

Hobson Squirter Washer *The best way to bolt!*

This is the sort of product that you just can't understand why you didn't think of it yourself. I know I am constantly saying it around our office. Hobson has exclusive distribution rights to this American patented and manufactured product in Australia & New Zealand. It is hard to get excited about a new fastener, but this one WILL excite anyone who wants to save on installation costs and KNOW the bolts on their project are tensioned correctly.

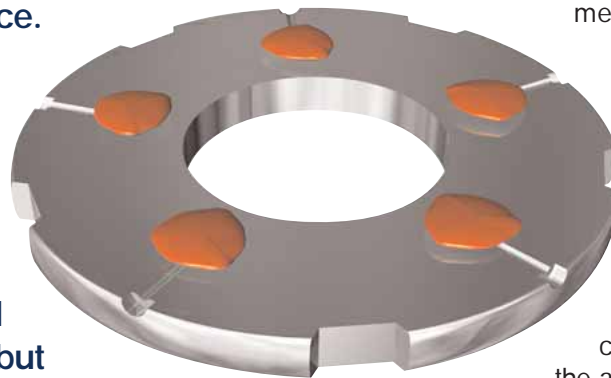
Most people in our industry talk about recommended bolting torques. In fact that is the terminology used by Standards Australia. Torque the assembly correctly and you will have no problems . . . it simply is NOT TRUE! The aim of recommended tightening torque values are to induce the required bolt tension in the assembly. However the correlation between tightening torque and bolt tension is not a simple one.

Hobson Engineering uses a "Skidmore" (hydraulic load cell, that indicates bolt tension) to demonstrate this principle. There is an excellent correlation between bolt tension and torque when a structural assembly is correctly lubricated. This is fine in the laboratory, but on job sites where bolts are left out in the weather, applying EXACTLY the same torque the Skidmore shows that the bolt tension is a fraction (up to 50%) less than is required.

AS4100 details only two systems to ensure that a structural assembly is correctly tensioned, the turn of nut method and a "DTI - Direct Tensioning Indication Device". The "turn of nut method" has a number of disadvantages:

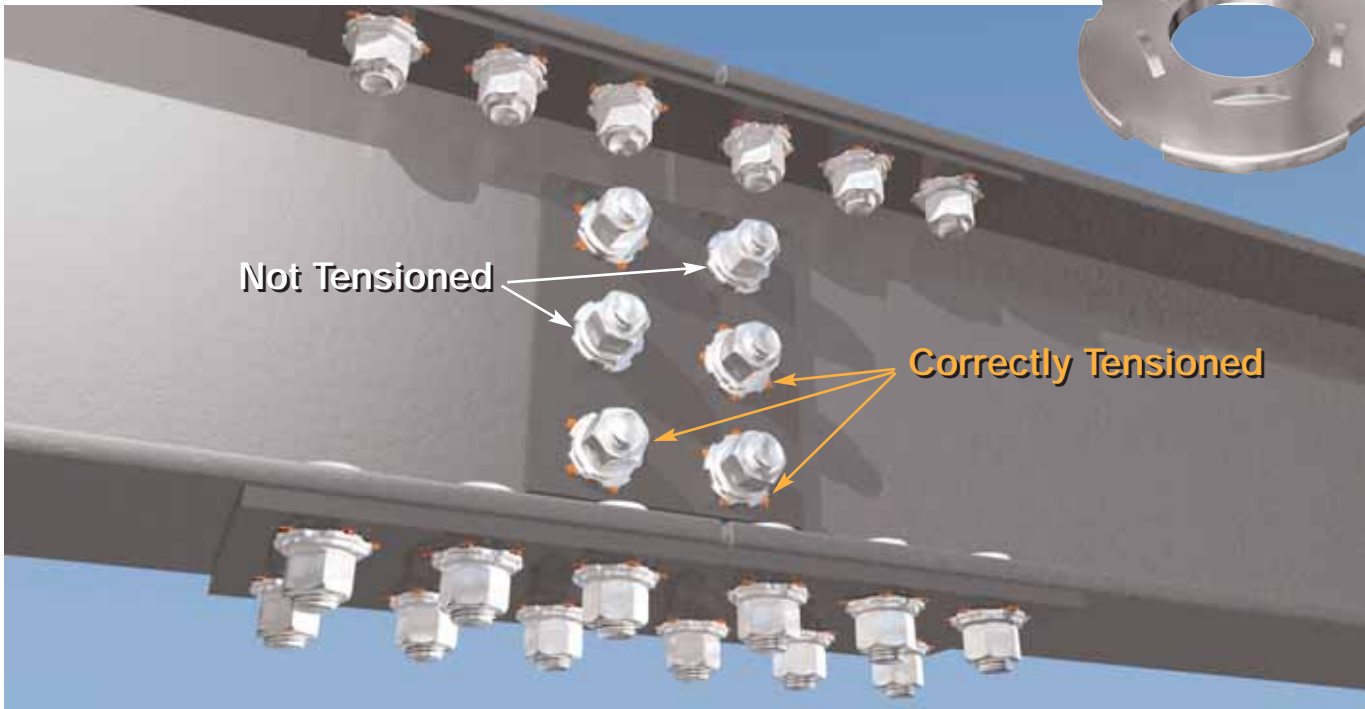
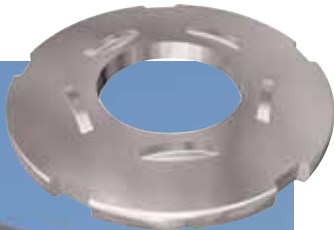
- It requires expertise
- It is slow and labour intensive if carried out correctly.
- There is no easy visual system to determine if the assembly is tensioned correctly. Most fabricators paint the assembly to indicate it has been tensioned. However whether it has or has not is still open to conjecture.

The biggest failure of the turn-of-nut system in my opinion is that if the bolt assembly is of poor quality (not meeting AS1252), the nut or bolt threads may strip and the installer will not be aware!



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The Hobson Squirter Washer is a very simple visual indicator of bolt tension. Its benefits are many as below:

- It meets the requirements of AS4100 for a Direct Tensioning Indication Device.
- It is VERY simple and requires no expertise.
- It correctly indicates bolt tension and is not affected by poor torque tension correlation factors such as weathering, poor lubrication and damaged threads.
- It gives a clear visual indication when the bolt assembly is tensioned correctly by "squirting" bright orange silicone.

By using Hobson Squirter Washers one is alerted to poor quality AS1252 assemblies. As the bolt assembly is guaranteed to be tensioned correctly, any non-conforming assemblies will be highlighted as they will fail in the tensioning process.

Site Engineers can easily and quickly inspect assemblies for correct tension by simply looking for the orange silicone. If there is no orange then the assembly has not been tensioned correctly!

Dramatically saves time on installation with reports of a dollar saving on each assembly (with the cost of the Hobson Squirter Washer included)

Manufactured in America. Each washer individually marked with a unique lot number. All test certificates available on line at www.hobson.com.au

Mechanically galvanised to avoid previous issues with Hot Dipped Galvanised old style DTI's.

For more information, please go to www.hobson.com.au or ask any of our offices for technical brochures on the Hobson Squirter Washer.

Hobson Engineering use a Skidmore (hydraulic load cell) for testing tension. The Squirter DTI Washer offers a mechanical load cell for each structural assembly that must be fully tensioned.

Recommended Service Temperatures of some Common Coatings

Use of coated fasteners at temperatures above approximately one-half the melting point of the coating is not recommended. Some guidelines follow:

Zinc	.....	210 °C
HDG	.....	210 °C
Inorganic Zinc Silicate	.....	210 °C
Xylan 1424	.....	205 °C
Cadmium	.....	160 °C
EM 1PX1 (Moly)	.....	130 °C

What's all this torque about?

In physics, torque (or often called a moment) can informally be thought of as “rotational force” or “angular force” which causes a change in rotational motion. This force is defined by linear force multiplied by a radius. The SI units for torque are newton metres. In the U.S., footpounds force (ft·lbs) are also commonly encountered. The symbol for torque is τ , the Greek letter tau. The force applied to a lever, multiplied by its distance from the lever’s fulcrum, is the torque. For example, a force of three newtons applied two metres from the fulcrum exerts the same torque as one newton applied six metres from the fulcrum. This assumes the force is in a direction at right angles to the straight lever.

Torque Conversion Factors (approx.)			
	N.m	m.kg	ft.lb
N.m	1	0.102	0.738
m.kg	9.81	1	7.24
ft.lb	1.36	0.138	1

Known Values

Multiply the known values by the figures in the table to obtain these units.

Mathematically, torque can be defined as:

$$\tau = r \times F$$

The diagram shows a wrench with a fulcrum at the head. A force F is applied downwards at the end of the handle, which is at a distance r from the fulcrum. This results in a torque τ that causes the wrench to rotate counter-clockwise.

Test Certificates are now available online www.hobson.com.au

AS1252 Structural

Grade 9 Plow Bolts

Select Product Group:

Enter Heat Number:

Open a file by clicking on either the PDF icon or the Heat Number.

Class 10.9 Hex Bolt

Squirter DTI Washer

Pipe Fittings

S38726
KBHSTGCM200240
AS1252-1983 HDG B/N/W: M20 x240

Hobson Engineering is pleased to offer Test Certificates online.

Simply go to www.hobson.com.au and follow the links until you get a page that looks like the one shown above. Choose your product group, enter your heat number (this can be found on the Hobson carton or on the product itself) and Go!

Test Certificate links are then shown and can be opened in PDF format for saving or printing.

We currently offer Test Certificates online for:

- AS1252 Structural Assemblies, Hex Nuts and Washers
- Squirter™ DTI Washers
- Class 10.9 Hex Bolts
- Grade 9 Plow Bolts & Grade 8 Plow Nuts
- High Pressure Pipe Fittings

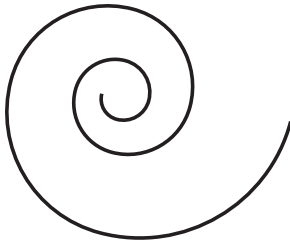
Structural Bolts Installation

AS4100-1998

WORKING DEFINITIONS

TORQUE

The energy taken to twist the nut up the thread of the bolt (Measured in Nm).



TENSION

The force generated in the bolt to clamp the steel plies together (Measured in kN).



AS1252 STRUCTURAL ASSEMBLIES CLASS 8.8 - MINIMUM BOLT TENSION

Nominal Size	Pitch	Minimum Bolt Tension Kn
M16	2.0	95
M20	2.5	145
M24	3.0	210
M30	3.5	335
M36	4.0	490

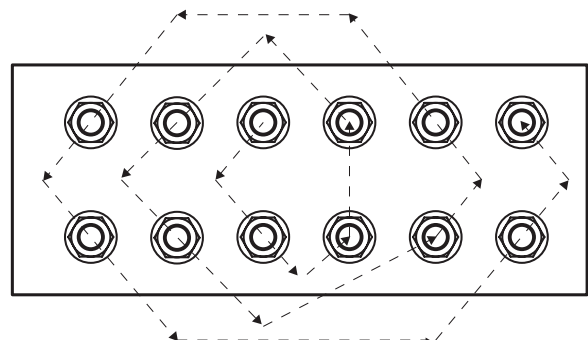
Note: the minimum bolt tension shown (AS4100-1998) is approximately equivalent to the minimum proof loads shown in AS1252-1996.

SNUG TIGHT

Prior to final tensioning of structural bolts the steel plies must be brought into effective contact. This is referred to as Snug-tight. i.e. no gap between the steel plates. Snug-tight can be achieved by a few impacts of an impact wrench or by the full effort of a person using a standard podger spanner. Correct bolt tension is required to ensure effective load transmission on the joint. Effective load transmission will not be achieved if a gap between the steel plates remains, which can occur if there is deformation from welding.

TIGHTENING PATTERN

Snug-tightening and final tensioning of the bolts in a connection shall proceed from the stiffest part of the connection towards the free edges. An example interpretation of a systematic pattern for tightening is provided (at right).



DELIVERY STORAGE & HANDLING

Structural bolt assemblies supplied to AS1252-1996 must be stored in the manufacturer's carton protected from wet weather. White rusting on the galvanised surface, dust and removal of the water soluble lubricant on the nut can severely affect installation and correct tensioning.

RE-USE OF STRUCTURAL ASSEMBLIES

Under no circumstances can a structural bolt which has been fully tensioned (i.e. the minimum values shown above) be re-used. If a bolt has been tensioned and then has to be removed it must be marked accordingly and destroyed.



Air impact wrenches, wheel nuts and race cars!

Most of us know that standard air impact wrenches are not accurate and they cannot be torque regulated. An actual torque adjustable gun costs many times more than a standard pressure regulated device.

On my last walk through the pits I noticed that all the garages were using air regulated impact wrenches to tighten the wheel nuts on their race cars. It gets very frantic in a pit area and changing wheels is something that sometimes needs to be done quickly, hence an air impact gun is almost always used. The good mechanics were then using a calibrated hand torque wrench to set the torque (and hopefully the tension!) in the wheel studs. On the surface these race mechanics were correctly carrying out the very important operation of bolting wheels on to the extremely expensive race cars they were entrusted with. The mechanics purely using air regulated wrenches were simply putting their drivers at risk by not accurately knowing if they had either over tightened or under tightened the wheel nuts.



Having a few hours between races (the major drawback of this sport) I continued to watch the "good" race mechanics tighten the wheels nuts with their torque wrenches, noticing however that the distinctive "Click" which indicated that the correct torque had been reached frequently occurred WITHOUT any further rotation. To put it another way, the wheel nuts had been tightened by the air gun to a higher torque than of the hand torque wrench! Hence they were wasting their time using the calibrated hand torque wrench. What they needed to do was to set the air pressure lower on the air gun and tighten ALL of the wheel nuts with the hand torque wrench, ensuring the wheel nuts actually turned before the "Click"!

...from previous issues of the Hobson Update

AS1252 Structural Assemblies



As I have written in a previous edition of the Hobson Update, the quality of High Tensile Fasteners in Australia is at the lowest point I have seen in 20 years. In general terms the constant drive for lower prices has led to a reduction in the quality of fasteners in Australia. Of course there are still some importers who sell quality high tensile product; the difficulty is discovering which ones.

There have been a number of failures of AS1252 assemblies in the past few months, but fortunately none I am aware of have resulted in serious injuries. One may make the point that if what I am proposing about the quality of AS1252 product is true, there should have been more devastating failures. I accept this; however one must realise that the safety factors used by structural engineers are of such a high magnitude that they in most occasions hide the sub-standard structural assemblies' failure to meet the Australian Standard . . .

Extract from Issue 21.

To view full article go to www.hobson.com.au

Are you getting your money's worth with stainless fasteners?

My last article on the degrading quality of fasteners in the Australian market drew a lot of attention and comment. We had many readers expressing their agreement to the article, stating it is just a matter of time until a serious failure occurs.

The article mainly concentrated on heat treated high tensile fasteners, however with the incredible increase in the cost of stainless steel, I am beginning to see examples of "fraudulent" stainless hitting our market.

Many importers are totally unaware of the material substitution that is occurring on a regular basis from second tier overseas manufacturers.

It is now becoming regular practice from some factories to supply 304 in lieu of 316 and 200 series stainless in lieu of 304. Even to the experienced eye, they are indistinguishable . . .

Extract from Issue 20

To view full article go to www.hobson.com.au

A conspiracy of increasing prices?

One may well ask why with the \$AUD heading higher are imported fasteners getting more expensive? If you haven't experienced this yet, you most certainly will and the extent may be very surprising indeed.

I can't remember the last time that fasteners actually increased in price; it certainly has been many years. The normal scenario is, a supplier will bring a new list out with a modest increase and the competition simply increase their discounts, with a net effect of lowering the price ! I doubt we will see this for many years again as no supplier is immune from the substantially higher cost of imported fasteners. Some may say, the dream time has finally come for the domestic manufacturers, however, if one seriously takes a look at domestic manufacturing it simply no longer exists in sufficient size to make any difference to the overall market.



The key to increasing prices is the "tiger" of Asia, namely China . . .

Extract from Issue 18

To view full article go to www.hobson.com.au

The Hobson Update is a publication of Hobson Engineering Co. Pty Ltd.

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This is the final printed edition of the Hobson Update

Future editions will be emailed as the **Hobson e-Update**

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Man and his Dog ...

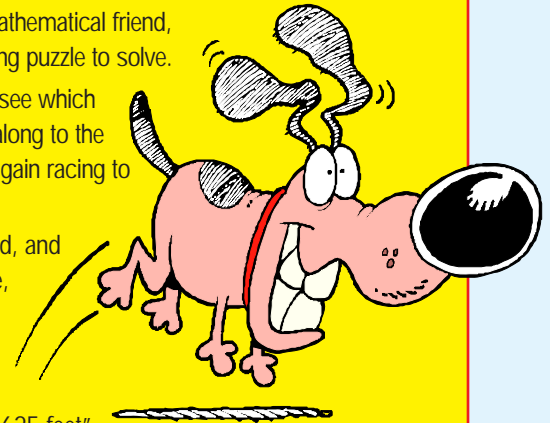
"Yes, when I take my dog for a walk," said a mathematical friend, "he frequently presents me with some interesting puzzle to solve.

One day, for example, he waited at the door to see which way I should go, and when I started he raced along to the end of the road, immediately returning to me; again racing to the end of the road and again returning.

He did this four times in all, at a uniform speed, and then ran at my side for the remaining distance, which according to my paces measured 27 yards.

I afterwards measured the distance from my door to the end of the road and found it to be 625 feet".

Now, if I walk 4 miles per hour, what is the speed of my dog when racing between me and the end of the road?



The Captive Queen



A captive queen and her son and daughter were shut up in the top room of a very high tower. Outside their window was a pulley with a rope around it, and a basket fastened to each end of the rope of equal weight. They managed to escape with the help of this and a weight they found in the room, quite safely. It would have been dangerous for any of them to come down if they weighed more than 15 lbs more than the content in the other basket, for they would do so too quickly. If they weighed less than the content of the other basket, they would not be able to descend at all.

The one basket coming down would naturally draw the other basket up.

The queen weighed 195 lbs, the daughter 105, the son 90 and the weight 75 lbs.

How did they all safely escape?

Up Hill and Down Hill

Two travellers spend from 3 o'clock until 9 in walking along a level road, up a hill and back home again; their pace on the level being 4 miles an hour, up hill 3 and down hill 6.

Find the distance walked: also (within half an hour) the time of reaching the top of the hill.



Answers to Issue 21 Quiz

1. Sequence

Vacant - Each word begins with the initials of the colours of the rainbow: red, orange, yellow, green, blue, indigo, violet.

2. Countries

Perusal - Peru, U.S.A, S.A.

3. Bottle

Simply push the cork into the bottle and shake the coin out.

"Don't talk to me about those bullfrogs up at the University. Half of them spend their lives writing theses about how to sew fly buttons on a pair of trousers" - Sir Henry Bolte



orange is good

bolting constitutes

Squirter™ DTI's (Direct Tension Indicator) take the headache out of bolting. Try **Squirter™ DTI's** on your next bolting project....you'll never go back.

2% Cost

80% headache



Features

- ✓ Manufactured to ASTM F959M.
- ✓ Conforms to AS4100-1990 15.4.1 (b) Direct-tensioning indication device.
- ✓ Lot trace number on each washer.
- ✓ Test Certificates available online www.hobson.com.au.
- ✓ Visual tension indication by Orange Silicon.
- ✓ Enables efficient & accurate installation of AS1252 structural assemblies.

Fabricators like them:

"They're easy and I know that I did it right."

Building certifiers like them:

"They're accurate, no torque wrenches or feeler gauges."

Project Managers like them:

"They're fast, we got the bolting approved in record time."

Easier & Better than Turn-of Nut

You don't have to remember to stop turning at 1/3rd, 1/2, or 2/3rds turn. No match marking necessary.

Saves Time

Enables correct tensioning as fast as the wrench can be moved to the next bolt, because the operator can see when to stop.

Works with All Bolt Lengths

Even when the bolts are extremely short or long, SQUIRTER™ DTI's show you when the correct tension has been achieved.

Safe for Inspectors

Once calibrated, inspectors can easily see the orange squirts, they don't have to climb to all the connections or carry around a torque wrench to know the connection has been completed. And instead of sampling only some of the DTI's with a feeler gage, squirters allow virtually 100% inspection.

Squirter™ DTI's



SQUIRTER™ DTI's (Direct Tension Indicator) are DTI's with a flexible silicone embedded in the depressions under the bumps. To use them, simply ... Tighten the bolt until the calibrated amount of orange silicone appears from under the DTI's squirt locations, then stop tightening. That's all there is to it.

Now you can see when the bolt assembly is tensioned correctly.

Since 1935

...because quality matters

SQUIRTER™ DTI's

the best way to bolt!

www.hobson.com.au

